

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

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PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing (day/month/year) 17 AUG 2007	
FOR FURTHER ACTION See paragraph 2 below	
Applicant's or agent's file reference 15409WO01	
International application No. PCT/US04/02511	International filing date (day/month/year) 29 January 2004 (29.01.2004)
Priority date (day/month/year)	
International Patent Classification (IPC) or both national classification and IPC IPC(8): C12P 7/00(2006.01) USPC: 435/132	
Applicant STEPAN COMPANY	

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

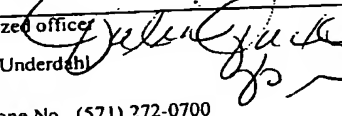
2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Date of completion of this opinion 28 June 2007 (28.06.2007)	Authorized officer  Thane Underdahl Telephone No. (571) 272-0700
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Form PCT/ISA/237 (cover sheet) (April 2005)

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US04/02511

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of:

- ☒ the international application in the language in which it was filed
☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

- ☐ a sequence listing
☐ table(s) related to the sequence listing

b. format of material

- ☐ on paper
☐ in electronic form

c. time of filing/furnishing

- ☐ contained in the international application as filed.
☐ filed together with the international application in electronic form.
☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US04/02511

Box No. V Reasoned statement under Rule 43 bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims <u>1-20</u>	YES
	Claims <u>NONE</u>	NO
Inventive step (IS)	Claims <u>NONE</u>	YES
	Claims <u>1-20</u>	NO
Industrial applicability (IA)	Claims <u>1-20</u>	YES
	Claims <u>NONE</u>	NO

2. Citations and explanations:

Claims 1-4 lack an inventive step under PCT Article 33(3) as being obvious over Sugiura et al. (U.S. Patent # 6361980). These claims are drawn to a process of preparing a controlled mixture of 1,2- and 1,3-diglycerides esters of fatty acids comprising the steps of (a) circulating a reaction mixture through an enzymatic reaction zone A that is maintained at a temperature conducive to enzymatic catalysis and step (b) circulating the reaction mixture through a thermal zone B at a temperature to facilitate the rearrangement of 1,3-diglycerides to 1,2-diglycerides. This method creates a mixture of glycerol, glyceride or a mixture in combination with fatty acids, fatty acid derivatives or mixtures thereof. Claims 2-4 limit the reaction conditions of the above process. Sugiura et al. teach a processes of an enzymatic reaction zone (Zone A) using a 1,3 specific lipase (Figure 1). The subsequent solution is fed into dehydration reactor (Zone B) that is heated where some 1,3-diglyceride is rearranged to 1,2-diglyceride (col 3, lines 1-5). The reaction temperatures for the two zones are as low as 20 °C for Zone A and Zone B is 40 °C.

Sugiura et al. teach the use of multiple saturated and unsaturated fatty acids, including glycerides of linoleic acids (col 10, claims 9 and 10). They also teach that the 1,3-specific lipase using in Zone A is obtained from *Rhizomucor miehi* as well as others (col 5, lines 45-50). This lipase is immobilized in a non-reactive matrix (col 5, lines 40-50). Sugiura et al. teach that the mole ratio of fatty acids to glycerol in their reaction mix is between 0.5:1 to 3.5:1. Sugiura et al. teach the recirculation of their reaction mix to the Zone A (col 2, lines 10-15) that produces triglycerides as well.

Claims 1-20 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.